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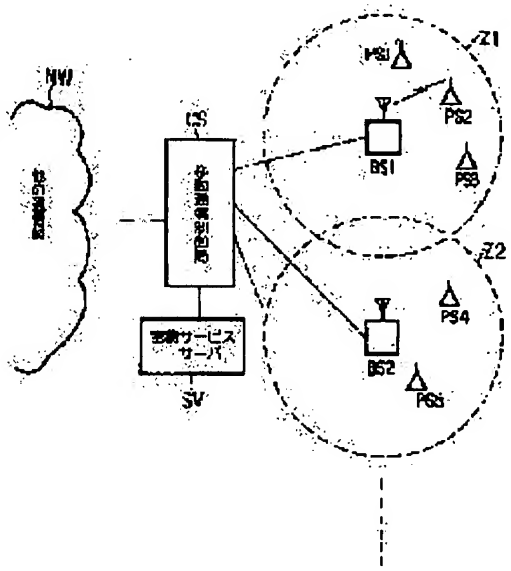
(54) MOBILE COMMUNICATION SYSTEM, MOBILE COMMUNICATION NETWORK USED FOR THE SYSTEM AND MOBILE COMMUNICATION EQUIPMENT

(57)Abstract:

PROBLEM TO BE SOLVED: To reduce the power consumption in the standby state and to improve the utilizing efficiency of a control channel by providing plural intermittent reception modes with a different period to the mobile communication equipment and informing the setting mode to the mobile communication network.

SOLUTION: Mobile communication equipments PS1, PS2,... of this system are provided with 1st and 2nd intermittent reception modes with a different reception period as an intermittent reception mode in the standby state. The 1st mode is a mode receiving a control channel sent from base stations BS1, BS2,... at a comparatively short period not causing a program such as connection delay and the 2nd mode is a mode with a long period to be set for a time zone with a low traffic. When either of the two modes is designated, the mobile communication equipments PS1, PS2,... start the reception by this intermittent reception mode and inform the intermittent reception mode to a control station CS. The control station CS sets a transmission timing of the control channel to a different timing in response to the informed intermittent reception mode.



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CLAIMS

[Claim(s)]
[Claim 1] In the migration communication system equipped with the mobil radio communication network which holds two or more migration communication devices and these migration communication devices through a radio channel, respectively each of two or more of said migration communication devices A receiving means to have two or more sorts of intermittent receive modes from which an intermittent receiving period differs, to set up these intermittent receive modes alternatively during waiting, and to perform intermittent reception actuation, It has a notice means of the intermittent receive mode for notifying the information about the intermittent receive mode under setup for this receiving means to said mobil radio communication network. Said mobil radio communication network Migration communication system characterized by having a transmitting means to transmit a signal the transmitting period corresponding to the intermittent receive mode notified from the migration communication device concerned, to said each migration communication device under waiting.
[Claim 2] In the migration communication system equipped with the mobil radio communication network which holds two or more migration communication devices and these migration communication devices through a radio channel, respectively each of two or more of said migration communication devices A receiving means to have two or more sorts of intermittent receive modes from which an intermittent receiving period differs, to set up these intermittent receive modes alternatively during waiting, and to perform intermittent reception actuation, It has a notice means of the intermittent receive mode for notifying the information about the intermittent receive mode under setup for this receiving means to said mobil radio communication network. Said mobil radio communication network The communication service judging means for judging the class of communication service which an origination side requires when the incoming call to said each migration communication device occurs, Migration communication system characterized by having a communications control means to perform arrival-of-the-mail processing of different contents to the migration communication device concerned, according to the intermittent receive mode under setup notified from the judgment result of this communication service judging means, and the migration communication device of an arrival-of-the-mail place.
[Claim 3] The communication service judging means of a mobil radio communication network judges whether the origination side is demanding whether two-way simultaneous communication service is demanded and one-way-communication service. And a communications control means It judges whether the 1st intermittent receive mode with an intermittent receiving period longer than a predetermined period is set as the migration communication device of the call-in point, or the 2nd intermittent receive mode shorter than a predetermined period is set up. Migration communication system according to claim 2 characterized by accumulating the received data accompanying the incoming call concerned in an are recording means when the incoming call which requires one-way-communication service from an origination side in the condition that said 1st intermittent receive mode is set up comes.
[Claim 4] A migration communication device responds at least to one side when a power source is turned on, and when self-equipment returns in the service area of said mobil radio communication

network. The existence of the are recording data addressed to self-equipment is asked to said mobil radio communication network. The communications control means of a mobil radio communication network Migration communication system according to claim 3 characterized by judging the existence of the corresponding are recording data and transmitting the judgment result to the migration communication device of inquiry origin when an inquiry of the existence of are recording data comes from a migration communication device.

[Claim 5] The communications control means of a mobil radio communication network is migration communication system according to claim 3 characterized by notifying the information which expresses the judgment result of the existence of said are recording data to each migration communication device instead of this control information when the existence of are recording data is judged for every migration communication device, the existence of effective control information which should transmit to all migration communication devices is judged and there is no effective control information.

[Claim 6] The communications control means of a mobil radio communication network is migration communication system according to claim 3 characterized by judging the existence of the are recording data of the addressing to a migration communication device concerned, and notifying the information showing the judgment result to said migration communication device when at least one side of the signals which require the signal which requires call origination from a migration communication device, and location registration comes, or when the incoming call to a migration communication device comes.

[Claim 7] A migration communication device synchronizes with the timing generated the period of the intermittent receive mode under setup, or based on this period. The existence of the are recording data addressed to self-equipment is asked to said mobil radio communication network. The communications control means of a mobil radio communication network Migration communication system according to claim 3 characterized by notifying the information which judges the existence of the are recording data which correspond when an inquiry of the existence of are recording data comes from a migration communication device, and expresses the judgment result to the migration communication device of inquiry origin.

[Claim 8] According to data, the existence of the are recording data addressed to self-equipment is asked to said mobil radio communication network for every fixed time of day. a migration communication device -- a clock function -- having -- the time check of this clock function -- The communications control means of a mobil radio communication network is migration communication system according to claim 3 characterized by notifying the information which judges the existence of the are recording data which correspond when an inquiry of the existence of are recording data comes from a migration communication device, and expresses the judgment result to the migration communication device of inquiry origin.

[Claim 9] A communications control means is migration communication system according to claim 4 to 8 characterized by transmitting the information which identifies the intermittent receiving period of the migration communication device concerned based on the information about the intermittent receive mode notified from the migration communication device, and expresses the judgment result of the existence of the are recording data of the addressing to a migration communication device concerned to said intermittent receiving period.

[Claim 10] A migration communication device is migration communication system according to claim 4 to 9 characterized by having a means to report this information to a user using at least one of a vision information means, an acoustic-sense information means, and tactile-sense information means when the information which expresses the judgment result of the existence of the are recording data addressed to a migration communication device from a mobil radio communication network is sent.

[Claim 11] In the migration communication system equipped with the mobil radio communication network which holds two or more migration communication devices and these migration communication devices through a radio channel, respectively each of two or more of said migration communication devices A receiving means to have two or more sorts of intermittent receive modes from which an intermittent receiving period differs, to set up these intermittent receive modes alternatively during waiting, and to perform intermittent reception actuation, It has a notice means of the intermittent

receive mode for notifying the information about the intermittent receive mode under setup for this receiving means to said mobil radio communication network. Said mobil radio communication network The communication service judging means for judging the class of communication service which an origination side requires when the incoming call to said each migration communication device occurs, It responds to the intermittent receive mode under setup notified from the judgment result of this communication service judging means, and the migration communication device of an arrival-of-the-mail place. Migration communication system characterized by having a communications control means to transmit the information which directs modification of the intermittent receive mode to the migration communication device concerned to the intermittent receiving period of the migration communication device concerned.

[Claim 12] The communication service judging means of a mobil radio communication network judges whether the origination side is demanding whether two-way simultaneous communication service is demanded and one-way-communication service. And a communications control means It judges whether the 1st intermittent receive mode with an intermittent receiving period longer than a predetermined period is set as the migration communication device of the call-in point, or the 2nd intermittent receive mode shorter than a predetermined period is set up. When the incoming call which requires two-way simultaneous communication service from an origination side in the condition that said 1st intermittent receive mode is set up comes Migration communication system according to claim 11 characterized by transmitting the directions information for making the intermittent receive mode change into said 2nd intermittent receive mode to the migration communication device of the call-in point.

[Claim 13] A communications control means judges whether the 1st intermittent receive mode with an intermittent receiving period longer than a predetermined period is set as the migration communication device of the call-in point, or the 2nd intermittent receive mode shorter than a predetermined period is set up. When the incoming call which requires two-way simultaneous communication service from an origination side in the condition that said 1st intermittent receive mode is set up comes It is the migration communication system according to claim 11 characterized by transmitting the directions information for the inside of predetermined time making a receiving means change into continuous reception mode at least to the migration communication device of the call-in point.

[Claim 14] A communications control means is migration communication system according to claim 12 or 13 characterized by having the function which notifies the information on to that effect to the migration communication device of the call-in point at the intermittent receiving period of opposite Perilla frutescens (L.) Britton var. crispa (Thunb.) Decne. while processing this incoming call as an incompleted call, when the incoming call which requires two-way simultaneous communication service from an origination side in the condition that said 1st intermittent receive mode is set up comes.

[Claim 15] A communications control means is migration communication system according to claim 12 or 13 characterized by having the function to transmit the message of the purport which requires a recurrence call to an origination side while processing this incoming call as an incompleted call, when the incoming call which requires two-way simultaneous communication service from an origination side in the condition that said 1st intermittent receive mode is set up comes.

[Claim 16] While having two or more sorts of intermittent receive modes from which an intermittent receiving period differs, setting up these intermittent receive modes alternatively during waiting and performing intermittent reception actuation In the mobil radio communication network which performs radio between the migration communication devices equipped with the function to transmit the information about the intermittent receive mode under this setup The communication service judging means for judging whether the origination side is demanding two-way simultaneous communication service or one-way-communication service is demanded, when the incoming call to said migration communication device occurs, Based on the information about the intermittent receive mode notified from the migration communication device of said call-in point The intermittent receive mode judging means for judging whether the 1st intermittent receive mode with an intermittent receiving period longer than a predetermined period is set as the migration communication device, or the 2nd intermittent receive mode shorter than a predetermined period is set up, The mobil radio communication network

characterized by providing a communications control means to accumulate the received data accompanying the incoming call concerned in an are recording means when the incoming call which requires one-way-communication service from an origination side in the condition that said 1st intermittent receive mode is set up comes.

[Claim 17] While having two or more sorts of intermittent receive modes from which an intermittent receiving period differs, setting up these intermittent receive modes alternatively during waiting and performing intermittent reception actuation In the mobil radio communication network which performs radio between the migration communication devices equipped with the function to transmit the information about the intermittent receive mode under this setup The communication service judging means for judging whether the origination side is demanding two-way simultaneous communication service or one-way-communication service is demanded, when the incoming call to said migration communication device occurs, Based on the information about the intermittent receive mode notified from the migration communication device of said call-in point The intermittent receive mode judging means for judging whether the 1st intermittent receive mode with an intermittent receiving period longer than a predetermined period is set as the migration communication device, or the 2nd intermittent receive mode shorter than a predetermined period is set up, When the incoming call which requires two-way simultaneous communication service from an origination side in the condition that said 1st intermittent receive mode is set up comes The mobil radio communication network characterized by providing a communications control means to transmit the directions information for making the intermittent receive mode change into said 2nd intermittent receive mode to the migration communication device of the call-in point.

[Claim 18] In the migration communication device which can respond to both two-way simultaneous communication service and one-way-communication service A receiving means to have two or more sorts of intermittent receive modes from which an intermittent receiving period differs, to set up these intermittent receive modes alternatively during waiting, and to perform intermittent reception actuation, A service assignment means for a user to do the assignment input of said two-way simultaneous communication service and the one-way-communication service alternatively, The migration communication device characterized by providing the intermittent receive mode setting control means which makes the optimal intermittent receive mode corresponding to the service by which the assignment input was carried out set it as said receiving means according to the assignment alter operation of the communication service in this service assignment means.

[Claim 19] In the migration communication device connected to a mobil radio communication network with the function which notifies the information showing the communication service which a call origination side requires in arrival-of-the-mail processing to a migration communication device A receiving means to have two or more sorts of intermittent receive modes from which an intermittent receiving period differs, to set up these intermittent receive modes alternatively during waiting, and to perform intermittent reception actuation, The migration communication device characterized by providing the intermittent receive mode setting control means which makes the optimal intermittent receive mode corresponding to this communication service set it as said receiving means according to the information showing the communication service notified from said mobil radio communication network.

[Claim 20] The migration communication device according to claim 18 or 19 characterized by having a means to display the information showing the intermittent receive mode under setup for a receiving means.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] With respect to migration communication system, such as a digital automobile and a cellular-phone system, and a personal handy phone system (PHS:Parsonal Handyphone System), especially this invention relates to the migration communication system which adopted the intermittent receiving method as the migration communication device, in order to attain low-power-ization at the time of waiting.
[0002]
[Description of the Prior Art] Generally, with migration communication system, in order to extend the time of the migration transmitter which is using the dc-battery as a power source, the intermittent receiving method is adopted. An intermittent receiving method is a method with which it reduces power consumption as only the period of the control channel by which each migration transmitter was assigned to self at the time of waiting operates a receiving circuit, performs reception actuation and does not perform reception actuation in other periods.
[0003] For example, in the digital cellular-phone system, many migration transmitters in a system are divided into two or more groups, and the arrival-of-the-mail control channel is assigned to these groups. Drawing 8 shows the channel configuration and one frame consists of one common channel F and eight paging channels P1-P8. Among these, the common channel F is assigned in common to a total displacement transmitter, and it is used in order to transmit the frame alignment signal and dispatch control channel number for making a migration transmitter establish frame synchronization, and its alien-system information. On the other hand, the paging channels P1-P8 are assigned to the 1st group thru/or the 8th group of a migration transmitter according to an individual, respectively, and since an arrival-of-the-mail control signal is sent out to the migration transmitter of each group, they are used.
[0004] As for each migration transmitter, only the receiving period of the channel assigned to the group to which the frame synchronization channel F and a self-opportunity belong, respectively performs reception actuation. For example, only the receiving period of the frame synchronization channel F and the paging channel P1 supplies a power source to required circuit parts, such as a receiving circuit, and each migration transmitter of the 1st group performs reception actuation, as shown in drawing 8 , and it suspends reception actuation by making supply of the above-mentioned power source into ** in other periods. Moreover, only the receiving period of the frame synchronization channel F and the paging channel P2 performs reception actuation, and each migration transmitter of the 2nd group suspends reception actuation at other periods. Like the following, only the receiving period of the paging channels P3-P8 assigned to the frame synchronization channel F and the self-group, respectively performs reception actuation, and each migration transmitter of the 3rd less than group suspends reception actuation at other periods.
[0005] If such intermittent reception actuation is performed, the migration transmitter of each group can save the power consumption of a circuit to two ninths compared with the case where reception actuation is always performed at the time of waiting.

[0006] In addition, the channel of F, P1-P8 of drawing 8 is a channel constituted logically, and those each does not necessarily need to support 1 to 1 with a physical frame. when [for example, / the case where one channel is transmitted with two or more physical frames, and when these physical frames are continuing in time] -- it is .
[0007]
[Problem(s) to be Solved by the Invention] By the way, what is necessary is to make [many] the number of group divisions of a migration transmitter, to get blocked comparatively the intermittent time of delivery over the whole receiving period, and just to make the rate of intermittent reception low, in order to reduce further the power consumption of the migration transmitter at the time of waiting. However, since an intermittent receiving period will become long if the rate of intermittent reception is made low, the timing which transmits an arrival-of-the-mail control signal will be overdue from a network, and the so-called post-dialing delay will become large. When this post-dialing delay becomes large and it is the communication service as which a sex is required instancy like a message, insecurity may be given to a calling party, or a calling party may take for failure depending on the case, call origination may be stopped, and it is not very desirable. That is, in the former, coexistence with the reduction of power consumption and the maintenance of serviceability by the intermittent receiving method was difficult, and it was anxious for the effective cure.
[0008] This invention is providing with mobile station equipment the migration communication system which was made paying attention to the above-mentioned situation, that 1st purpose's reduced further the power consumption at the time of waiting in a migration communication device, moreover reduced the unnecessary signal transmission to the migration communication device under waiting from the mobil radio communication network, and aimed at improvement in the rate of a deployment of a control channel, and its mobil radio communication network list.
[0009] Moreover, the 2nd purpose is providing with mobile station equipment the migration communication system which can lengthen an intermittent receiving period, can aim at much more reduction of the power consumption at the time of waiting, can mitigate the bad influence to the incoming call produced by moreover lengthening an intermittent receiving period, and can hold good serviceability, and its mobil radio communication network list.
[0010]
[Means for Solving the Problem] In order to attain the 1st purpose of the above this invention In the migration communication system equipped with the mobil radio communication network which holds two or more migration communication devices and these migration communication devices through a radio channel, respectively A receiving means to set up alternatively two or more sorts of intermittent receive modes from which an intermittent receiving period differs during waiting, and to perform intermittent reception actuation to each of two or more above-mentioned migration communication devices, It has a notice means of the intermittent receive mode to notify the information about the intermittent receive mode under setup for this receiving means to the above-mentioned mobil radio communication network. And it has a transmitting means to transmit a signal the transmitting period corresponding to the intermittent receive mode notified to the mobil radio communication network from the migration communication device concerned to each migration communication device under waiting.
[0011] If the mode in which an intermittent receiving period is long is set to at night when the mode in which an intermittent receiving period is short is set to daytime, and traffic decreases for every migration communication device according to this invention as a result, the power consumption in the night of a migration communication device can be reduced further, and, thereby, at least one of extension of battery life and the formation of small lightweight of the equipment by reduction of power resource can be realized.
[0012] Moreover, also in a mobil radio communication network, since transmission of a signal will be performed only to the transmit timing according to the intermittent receive mode under setup for every migration communication device, it enables this to no longer perform useless signal transmission and to raise the rate of a deployment of a control channel.
[0013] Moreover, a communication service judging means to judge the class of communication service

which an origination side requires in the migration communication system of this invention when the incoming call to each above-mentioned migration communication device occurs in the above-mentioned mobil radio communication network, It has a communications control means and is made to perform arrival-of-the-mail processing of the contents which change to the migration communication device concerned with these communications control means according to the intermittent receive mode under setup notified from the judgment result of the above-mentioned communication service judging means, and the migration communication device of an arrival-of-the-mail place.

[0014] That is, communication service has the two-way simultaneous communication service with which a calling party and a call-in person communicate to coincidence in both directions, and the one-way-communication service which transmits data to a target on the other hand from a call origination side like a voice mail service, facsimile, a text communication link, and pictorial communication like a telephone with voice, or a TV phone. Among these, two-way simultaneous communication service cannot communicate, if the migration transmitter of a destination side does not answer to an incoming call, but if there is even a facility of intercepting, one-way-communication service can receive data, even if a migration transmitter does not necessarily answer to an incoming call.

[0015] This invention gives two or more sorts of intermittent receive modes from which a period differs to a migration communication device paying attention to the above points, and is reducing the power consumption under waiting further by setting like Nighttime the mode in which a period is long as the time zone when traffic is comparatively low. However, if an incoming call occurs at the period when the intermittent receive mode with a period long in this way is set up, big post-dialing delay may be unable to occur or it may be unable to connect substantially. Then, it judges whether as the cure, from the migration communication device, the intermittent receive mode under setup is notified to a mobil radio communication network, and the intermittent receive mode with a long period is set as the migration communication device in the mobil radio communication network. And if the incoming call to the migration communication device with which the intermittent receive mode with a long period is set up comes, when this incoming call will judge what requires two-way simultaneous communication service, or the thing which requires one-way-communication service and one-way-communication service will be demanded, for example, the above-mentioned incoming call is connected to an are recording means like an are recording service server, and the data sent from a call origination side are made to accumulate to an are recording means.

[0016] Thus, when the intermittent receive mode of a long period is set as the migration communication device by having constituted and incoming calls which carry out a one-way-communication service request, such as facsimile communication, occur, it is judged that it is not necessary to make a migration communication device answer, and received data are accumulated in an are recording service server. For this reason, even if the intermittent receive mode of a long period is set as the migration communication device, to the incoming call which carries out a one-way-communication service request at least, without producing big post-dialing delay or considering as an incompleted call, it can answer certainly instancy and data can be received. Therefore, the bad influence which it becomes unnecessary to make a calling party do rehanging etc., and this has on a calling party is mitigated.

[0017] Moreover, in this invention, when received data are accumulated in an are recording service server etc., the various methods for notifying that to the corresponding migration communication device are offered collectively.

[0018] When it returns in the service area of the time of a power source being turned on with a migration communication device, or a mobil radio communication network, and the existence of the are recording data addressed to self-equipment is asked to a mobil radio communication network from a migration communication device and this inquiry comes from a migration communication device, that 1st method judges the existence of the are recording data which correspond in a mobil radio communication network, and transmits that judgment result to the migration communication device of inquiry origin.

[0019] In a mobil radio communication network, the 2nd method notifies the information which expresses the judgment result of the existence of are recording data to each migration communication device instead of this control information, when the existence of are recording data is judged for every

migration communication device, the existence of effective control information which should transmit to all migration communication devices is judged and there is no effective control information.
[0020] When the signal which requires call origination from a migration communication device, and the signal which requires location registration come, or when the incoming call to a migration communication device comes, the 3rd method judges the existence of the are recording data of the addressing to a migration communication device concerned, and notifies the information showing the judgment result to a migration communication device.
[0021] In a migration communication device, when the existence of the are recording data addressed to self-equipment is asked to a mobil radio communication network and this inquiry comes synchronizing with the timing generated the period of the intermittent receive mode under setup, or based on this period, the 4th method judges the existence of the are-recording data which correspond in a mobil radio communication network, and notifies the information showing that judgment result to the migration communication device of inquiry origin.
[0022] the 5th method -- the time check of a clock function -- when the existence of the are recording data addressed to self-equipment is asked to a mobil radio communication network according to data for every fixed time of day and this inquiry comes, the existence of the are recording data which correspond in a mobil radio communication network is judged, and the information showing that judgment result is notified to the migration communication device of inquiry origin.
[0023] On the other hand, other invention is characterized by transmitting the information which directs modification of the intermittent receive mode to the migration communication device concerned, and making it make the intermittent receive mode of a migration communication device change into a short thing with the communications control means of a mobil radio communication network from what has a long period according to the class of communication service which the incoming call is demanding, and the intermittent receive mode under setup notified from the migration communication device of an arrival-of-the-mail place.
[0024] That is, since there is big post-dialing delay even if a calling party performs call origination what times when the generated incoming call is the two-way simultaneous communication service which needs to be made to answer the migration communication device itself, and the intermittent receive mode of a long period is set as the migration communication device, smooth connection is not made.
[0025] So, when the incoming call which requires two-way simultaneous communication service from the migration communication device with which the intermittent receive mode of a long period is set up occurs, send modification directions of the intermittent receive mode from a mobil radio communication network to a migration communication device, and the intermittent receive mode is made by this to change into a short thing from what has a long period, or it is made to change into continuous reception mode temporarily.
[0026] thus -- the time of telephoning again, once the calling party stopped call origination by carrying out -- the migration communication device of an arrival-of-the-mail place -- the intermittent receive mode of a short period -- or since continuous reception mode will be set up, smooth arrival-of-the-mail connection is attained, without producing big post-dialing delay.
[0027]
[Embodiment of the Invention] Drawing 1 is the outline block diagram of the digital cellular-phone system which is the gestalt of 1 operation of the migration communication system concerning this invention. Two or more base stations BS1 and BS2 where this system was geographically distributed in the service area, and --, These base stations BS1 and BS2 and the migration communications control station CS to which -- was connected through the wire circuit, respectively It has in inside the base stations BS1 and BS2 and two or more migration transmitters PS1 and PS2 connected to -- through a radio channel of the above-mentioned base stations BS1 and BS2, the wireless zones Z1 and Z2 which -- forms, and --, and --.
[0028] Among these, base stations BS1 and BS2, --, the migration communications control station CS constitute a mobil radio communication network, and the migration communications control station CS is connected to other communication networks NW, such as a cable fixed network and other mobil radio

communication networks. Moreover, the are recording service server SV is connected to the migration communications control station CS. This are recording service server SV is used in order to accumulate the migration transmitters PS1 and PS2, and the voice mail information and facsimile mail information addressed to --.

[0029] The migration transmitters PS1 and PS2 and -- are divided into eight groups, and the migration communications control office CS manages arrival-of-the-mail control, location registration control, etc. to the migration transmitters PS1 and PS2 and -- for every groups of these.

[0030] By the way, each migration transmitters PS1 and PS2 of this system and -- are equipped with the 1st intermittent receive mode and the 2nd intermittent receive mode as the intermittent receive mode at the time of waiting. The 1st intermittent receive mode is the mode in which the control channel transmitted from base stations BS1 and BS2 and -- is received intermittently the comparatively short period T1 (for example, 1 second) which does not produce problems, such as post-dialing delay. On the other hand, the 2nd intermittent receive mode is the mode in which the control channel transmitted from base stations BS1 and BS2 and -- is received intermittently the long period T1 (for example, 480 seconds) suitable for the time zone when traffic, such as Nighttime, becomes very low.

[0031] moreover, each migration transmitters PS1 and PS2 and -- either these [1st] or the 2nd intermittent receive mode -- the time check of a clock circuit -- when set automatically according to time of day, or when input assignment is carried out by a user's key stroke, while starting the intermittent reception actuation by this specified intermittent receive mode, the procedure for notifying the information on the above-mentioned intermittent receive mode to the migration communications control station CS is performed.

[0032] On the other hand, the migration communications control station CS sets the transmit timing of the control channel to each migration transmitters PS1 and PS2 and -- as different timing according to each above-mentioned migration transmitters PS1 and PS2 and the intermittent receive mode notified from --.

[0033] Drawing 2 and drawing 3 are the transmit timing of the migration communications control office CS in the above 1st and each 2nd intermittent receive mode, and each migration transmitters PS1 and PS2 and drawing of -- showing an example of receiving timing, respectively.

[0034] The migration communications control station CS makes the control channel the super frame structure. That is, 1 super frame consists of eight frames by which Time Division Multiplexing was carried out to the super frame synchronization channel SF. The super frame synchronization channel SF is used in order to transmit the super frame alignment signal for [of the migration transmitters PS1 and PS2 and --] making frame synchronization establish to a total displacement transmitter.

[0035] one frame -- the subframe respectively for the long periods of one piece, and 60 subframes L for short periods (L1-1 -L1-60) -- from -- it is constituted. That is, eight subframes M1-M8 for long periods will be arranged at equal intervals at 1 super frame. These subframes M1-M8 are assigned to the 8th group from the 1st group of a migration transmitter, respectively, and they are used in order to transmit an arrival-of-the-mail control signal etc. to the migration transmitter with which the mode of the long period T2 was set up as the intermittent receive mode.

[0036] The subframe L for short periods and (L1-1 -L1-60) consist of a frame synchronization channel F and eight paging channels P1-P8, as shown in drawing 2 , respectively. The frame synchronization channel F is used in order to supply the frame alignment signal and dispatch control channel number for making a migration transmitter establish frame synchronization, and its alien-system information to all migration transmitters regardless of a group. On the other hand, the paging channels P1-P8 are assigned to the 1st group thru/or the 8th group of a migration transmitter according to an individual, respectively, and since an arrival-of-the-mail control signal etc. is sent out to the migration transmitter of each group with which the mode of the short period T1 was set up as the intermittent receive mode, they are used.

[0037] On the other hand, when the intermittent receive mode of the short period T1 is set up, as for each group of a migration transmitter, only the receiving period of the paging channels P1-P8 assigned to the frame synchronization channel F and the self-group the subframe period performs reception actuation. For example, as shown in drawing 2 , as for the migration transmitter of the 1st group, only as

for the receiving period of the frame synchronization channel F and the paging channel P1, only the receiving period of the frame synchronization channel F and the paging channel P2 performs reception actuation, respectively, as for the migration transmitter of the 2nd group. As for the migration transmitter of the 3rd group - the 8th group, only the receiving period of the frame synchronization channel F and the paging channels P3-P8 performs reception actuation similarly, respectively.
[0038] On the other hand, when the intermittent receive mode of the long period T2 is set up, as for each group of a migration transmitter, only the receiving period of the subframes M1-M8 for long periods assigned to the super frame synchronization channel SF and the self-group 1 multi-framing period performs reception actuation. For example, as shown in drawing 3 , as for the migration transmitter of the 1st group, only as for the receiving period of the super frame synchronization channel SF and the subframe M1 for long periods, only the receiving period of the super frame synchronization channel SF and a subframe M2 performs reception actuation, respectively, as for the migration transmitter of the 2nd group. As for the migration transmitter of the 3rd group - the 8th group, only the super frame synchronization channel SF and the receiving channel of the subframes M3-M8 for long periods perform reception actuation similarly, respectively.
[0039] Moreover, the migration communications control station CS is equipped with the function to perform alternatively arrival-of-the-mail control using the are recording service server SV, and arrival-of-the-mail control containing the modification procedure of the intermittent receive mode, according to the class of the above-mentioned intermittent receive mode and communication service at the time of arrival of the mail.
[0040] The arrival-of-the-mail control using the are recording service server SV stores up the facsimile data which called the are recording service server SV, without carrying out the arrival-of-the-mail processing to a migration transmitter, and were sent to it from the origination side when the call in which requires one-way-communication service of facsimile communication etc. occurred in addressing to a migration transmitter to which the intermittent receive mode of the long period T2 was set in the are recording service server SV. Moreover, when the existence of the are recording data which correspond when an inquiry of the existence of are recording data to a self-opportunity comes from the migration transmitters PS1 and PS2 and -- is judged and there are corresponding are recording data, applicable data are read from the are recording service server SV, and it is made to transmit to the migration transmitter of inquiry origin with it.
[0041] The arrival-of-the-mail control containing the modification procedure of the intermittent receive mode As opposed to the migration transmitters PS1 and PS2 and -- to which the intermittent receive mode of the long period T2 was set When the call in which requires two-way simultaneous communication service of a voice message, a visual telephone, etc. occurs The directions for making the intermittent receive mode change into the mode of the short period T1 from the mode of the long period T2 to the migration transmitter of an arrival-of-the-mail place are sent, and, thereby, the intermittent receive mode of a migration transmitter is made to change into the mode of the short period T1. Moreover, while notifying the purport which arrival of the mail generated to the migration transmitter of an arrival-of-the-mail place in that case, the message directed that time amount is set and carries out call origination again to a calling party is returned.
[0042] Next, it explains using the flow chart which shows actuation of the system constituted as mentioned above to drawing 4 thru/or drawing 7 . the migration transmitters PS1 and PS2 and -- setting -- the time check of a clock circuit -- according to time of day, the intermittent receive mode of the short period T1 (T1= 1 second) is set to day ranges, for example, the intermittent receive mode of the long period T2 (T2= 480 seconds) is automatically set to Nighttime from 10:00 p.m. to 7:00 a.m. of the next morning. A user can set a setup of the change time of day as arbitration by actuation of a function key and a dialing key. Moreover, a setup of the above-mentioned intermittent receive mode can also be set as arbitration by actuation of the function key by the user, and a dialing key.
[0043] The migration transmitters PS1 and PS2 and -- perform intermittent reception actuation of an arrival-of-the-mail control channel according to the intermittent receive mode by which a setup was carried out [above-mentioned] in the waiting condition. Moreover, the information on the intermittent

receive mode by which a setup was carried out [above-mentioned] It is notified to the migration communications control station CS through base stations BS1 and BS2 and -- by using a call origination control channel. While matching this notified intermittent receive mode with the migration transmitters PS1 and PS2 and -- and memorizing it in the migration communications control station CS, respectively An arrival-of-the-mail control channel is set up with the period corresponding to the migration transmitters PS1 and PS2 under waiting, and the intermittent receive mode which carried out [above-mentioned] storage to --, and a call-in signal etc. is transmitted using this arrival-of-the-mail control channel.

[0044] Now, arrival of the terminating signal of addressing to migration transmitter PSi held in the self-system from other communication networks NW in this condition judges whether the migration communications control office CS is the mode of whether as shown in drawing 4 , the intermittent receive mode first set as the migration transmitter PSi by step 4a now is the mode of the short period T1, and the long period T2.

[0045] And if the intermittent receive mode of the short period T1 is setting up, the call-in signal which shifts to step 4b as it is, and contains the identification number of the migration transmitter PSi here is sent out. At this time, the transmit timing of a call-in signal is set as the arrival-of-the-mail control channel for the short period T1 modes assigned to the group to which the migration transmitter PSi belongs. For example, if the migration transmitter PSi belongs to the 1st group now, as shown in drawing 2 , it is set as the paging channel P1 in each subframe L. Then, the transmitted above-mentioned call-in signal is transmitted to the migration transmitter PSi, after the migration transmitter PSi is relayed in the base station BSj by which location registration is carried out.

[0046] In the migration transmitter PSi, intermittent reception actuation by the short period T1 mode is performed in the paging channel P1 of the 1st group to which a self-opportunity belongs as shown in above-mentioned drawing 2 . And if the call-in signal addressed to a self-opportunity comes in this condition, the migration transmitter PSi will shift to step 4e from step 4d, and will transmit a call-in reply signal through a control channel here. If this call-in reply signal is received, a base station BSj will shift to step 4g from step 4f, will be vacant out of many communication channels here, will choose a channel, and will notify the communication channel of this opening to the migration transmitter PSi using an arrival-of-the-mail control channel.

[0047] If the migration transmitter PSi receives this notice of channel designation, the communication channel of a self-opportunity is changed to the communication channel concerned by step 4h, singing etc. will be further generated in step 4i, and arrival-of-the-mail information to a user will be performed. And if step 4j performs an off-hook monitor in this condition, and a user checks arrival-of-the-mail information and performs off-hook actuation, after an off-hook signal is relayed in a base station BSj, it will be transmitted to other communication networks NW of a sending agency. Consequently, it connects through a communication link and the communication link of between a dispatch partner terminal and the migration transmitters PSi of the above-mentioned arrival-of-the-mail place is henceforth attained among both.

[0048] By the way, since the migration transmitter PSi turns off the electric power switch and has come outside the service area of a base station, suppose that a call-in reply signal was not returned to a base station. If it does so, a base station BSj will shift to step 4l. from step 4f, and will transmit a non-receiving report to the migration communications control station CS here. If this non-receiving report is received, the migration communications control station CS will check this report by step 4m, and will shift to the are recording control mentioned later henceforth.

[0049] Moreover, suppose that the intermittent receive mode under setup to the migration transmitter PSi of an arrival-of-the-mail place was the mode of the long period T2. In this case, it judges that the migration communications control station CS has a possibility that post-dialing delay may become large too much, and it may become impossible to perform normal arrival-of-the-mail actuation when arrival-of-the-mail control is performed as it is, and shifts to the are recording control using the are recording service server SV, or modification control of an intermittent receiving period.

[0050] That is, it judges whether the migration communications control office CS is one-way-

communication service of whether as shown in drawing 5 , the communication service which the terminal of a sending agency is demanding in step 5a first is two-way simultaneous communication service of a telephone, a TV phone, etc., a voice mail service, facsimile mail, data communication, etc., etc. And if it is one-way-communication service, it will shift to step 5b and will judge whether the migration transmitter PSi is the contractor of are recording service, and if it is not a contractor, it will shift to step 5g and cutting processing will be performed here. In addition, busy tone etc. is transmitted to the terminal of a sending agency at this time.

[0051] Now, the migration transmitter PSi presupposes now that he was the contractor of are recording service temporarily. If it does so, the migration communications control station CS will perform are recording control henceforth. That is, it shifts to step 5c first, the are recording service server SV is connected to an incoming call here, and the guidance message which stimulates transmission of a message etc. by step 5d is sent out to the terminal of a sending agency. And the message sent from the terminal of an origination side in step 5e is stored up in the are recording service server SV. After are recording is completed, it shifts to step 5g from step 5f, cutting processing is performed, and it returns to a waiting condition.

[0052] The migration transmitter PSi is in a condition out of control, and it is supervising whether the self-opportunity returned to the controllable condition by step 6b, receiving the signal transmitted by the arrival-of-the-mail control channel in step 6a from a base station BSj, as shown in drawing 6 . In addition, if the migration transmitter PSi is the intermittent receive mode of the long period T2 at this time, signal sending out by the above-mentioned arrival-of-the-mail control channel is transmitted only in the arrival-of-the-mail control channel for the long period T2 modes assigned to the group to which a self-opportunity belongs as shown in drawing 3 .

[0053] It is in this condition, for example, by switching on the electric power switch of the migration transmitter PSi, the migration transmitter PSi judges it as what returned to the controllable condition when the arrival-of-the-mail control channel from a base station BSj was received by return and this in the service area, and it shifts to step 6c, and judges whether the self-opportunity is contracting in are recording service here. And when having contracted in are recording service, after changing to a call origination control channel by step 6d, it shifts to step 6e, and an are recording server access request signal is transmitted here. In addition, when having not contracted in are recording service, it shifts to the usual waiting control as it is, without transmitting the above-mentioned access request signal etc. That is, useless signal sending out is not performed and, thereby, the traffic of a control channel is not pressed.

[0054] If the above-mentioned are recording server access request signal is relayed by step 6f in a base station BSj and is transmitted to the migration communications control station CS, it will judge whether the migration communications control station CS shifts to step 6h from step 6g, and the data of addressing to migration transmitter PSi of the above-mentioned access request origin are stored in the are recording service server SV here. And supposing data were stored, it will shift to step 6l., the are recording service server SV will be connected to the migration transmitter PSi of the above-mentioned access request origin here, and assignment directions of a communication channel will be given to a base station BSj by step 6m. And sending out of an are recording message is directed to the are recording service server SV.

[0055] If assignment directions of the above-mentioned communication channel are received, a base station BSj will choose an empty communication channel from many communication channels by step 6n, and will notify the communication channel of this opening to the migration transmitter PSi using a call origination control channel. If the migration transmitter PSi receives assignment of the above-mentioned communication channel, a call origination control channel will be changed to the communication channel concerned by step 6o, and the are recording message which shifts to step 6q henceforth and is sent from the are recording service server SV is received.

[0056] In this way, the are recording data transfer from the migration transmitter PSi to the inquiry of data accumulation to the migration communications control station CS and the migration transmitter PSi according to this inquiry from the are recording service server SV is performed.

[0057] Next, modification control of an intermittent receiving period is explained. If the migration communications control office CS judges with the communication service which the terminal of a sending agency is demanding in step 5a shown in drawing 5 being two-way simultaneous communication service of a telephone, a TV phone, etc., it will perform modification control of an intermittent receiving period henceforth. That is, as shown in drawing 7 , the modification indication signal of an intermittent receiving period is first sent out by step 7a using an arrival-of-the-mail control channel. If this modification indication signal is relayed by step 7b and comes in a base station BSj, the migration transmitter PSi will shift to step 7d from step 7c, and will change the intermittent receive mode under setup of a self-opportunity into the mode of the short period T1 from the mode of the long period T2 here. And in step 7e, the reply signal over modification of the intermittent receive mode is returned, and it returns to waiting control henceforth.
[0058] If this reply signal is relayed by step 7f and comes in a base station BSj, the migration communications control station CS shifts to step 7h from step 7g, will match the intermittent receive mode after the above-mentioned modification with the migration transmitter PSi, will memorize it here, and will return to waiting control henceforth.
[0059] In addition, the migration communications control station CS sends out the guidance message which stimulates that a telephone reapplies to the terminal of a sending agency during modification control of the above intermittent receiving period, or after control termination. as this guidance message -- for example -- "-- it is [receiving] under preparation now. please correct credit after 1 minute execuse me. " -- it is used. In addition, the voice-told message by which a sound-reinforcement output is carried out from the loudspeaker of a master station is sufficient as this guidance message, and the display message displayed on a liquid crystal display is sufficient as it. Moreover, when using this display message, it is good to combine, to blink light emitting diode, or to generate singing, and to make a user notice more certainly by this.
[0060] Moreover, the guidance message of the purport which arrival of the mail generated with the intermittent receiving period modification indication signal is sent to the migration transmitter PSi of an arrival-of-the-mail place from the migration communications control station CS. The migration transmitter PSi will display the above-mentioned guidance message on a liquid crystal display after modification control termination of an intermittent receiving period, if the above-mentioned guidance message comes. as this guidance message -- for example -- "-- a telephone call is got soon. please wait then. " -- it is used. In addition, it may be made to carry out short-time generating of the different singing from arrival-of-the-mail singing with the display of the above-mentioned guidance message. If it does in this way, the user of a migration transmitter can be made to stand by to arrival of the mail.
[0061] Two kinds of intermittent receive modes from which a period differs are given to the migration transmitters PS1 and PS2 and --, and while changing these modes automatically by time amount and setting them up, he is trying to set it as arbitration by a user's key stroke with the gestalt of this operation as mentioned above. for this reason -- for example, it can make it possible to perform intermittent reception actuation of the long period T2 in the low night of traffic, power consumption at night can be stopped by this, and the life of a cell can be made to extend further
[0062] And the migration transmitters PS1 and PS2 and the intermittent receive mode set as -- are notified to the migration communications control station CS, and the migration communications control station CS memorizes this notified intermittent receive mode to every migration transmitter PS1 and PS2 and --, and is made to perform signal sending out by the arrival-of-the-mail control channel with the period according to the intermittent receive mode under above-mentioned setup to the migration transmitter under waiting. For this reason, in the timing according to that intermittent receive mode, a call-in signal etc. can be transmitted to each migration transmitters PS1 and PS2 and every --, useless signal transmission is no longer performed by this, and the rate of a deployment of an arrival-of-the-mail control channel can be raised.
[0063] Moreover, the class of communication service which an incoming call requires with the gestalt of this operation when an incoming call comes, The intermittent receive mode under setup to the migration transmitter PSi of an arrival-of-the-mail place is judged, respectively. When the intermittent receive

mode of the long period T2 is set as the migration transmitter PSi of an arrival-of-the-mail place and the incoming call is demanding one-way-communication service of a voice mail service, facsimile mail, etc., he connects the are recording service server SV to the above-mentioned incoming call, and is trying to store the data from an origination side. For this reason, even if the intermittent receive mode of the long period T2 is set as the migration transmitter PSi, to the incoming call which carries out a one-way-communication service request, without producing big post-dialing delay or considering as an incompleted call, it can answer certainly instancy and data can be received. Therefore, it becomes unnecessary for a calling party to perform rehanging etc., and, thereby, he can hold a calling party's convenience highly.

[0064] Moreover, when it returns in the case where the migration transmitter PSi switches on a power source, or a service area, it judges whether the data of addressing to migration transmitter PSi which corresponds if the access request of an are recording server is transmitted to the migration communications control station CS from the migration transmitter PSi and the migration communications control station CS receives this access request are stored. And when accumulated, he connects the are recording service server SV to the above-mentioned migration transmitter PSi, and is trying to transmit are recording data. Therefore, the migration transmitter PSi can know automatically the existence of the are recording data addressed to a self-opportunity at the time of power-source ON and the return to a service area, and when there are are recording data further, it can receive this data automatically.

[0065] When the intermittent receive mode of the long period T2 is set as the migration transmitter PSi of an arrival-of-the-mail place and the incoming call is demanding two-way simultaneous communication service of a telephone, a TV phone, etc., he sends modification directions of the intermittent receive mode from the migration communications control station CS to the migration transmitter PSi, and is trying to make the intermittent receive mode by this change into the mode of the short period T1 from the mode of the long period T2 with the gestalt of this operation furthermore. moreover, he sets time amount to a calling party, and is trying to notify him of the guidance message which is again applied and which is carried out in that case

[0066] For this reason, since the intermittent receive mode of the short period T1 will be set to the migration transmitter PSi of an arrival-of-the-mail place when telephoning again once the calling party stopped call origination, smooth arrival-of-the-mail connection is attained, without producing big post-dialing delay.

[0067] (Gestalt of other operations) Although an are recording service access demand signal is transmitted to the migration communications control station CS from the migration transmitters PS1 and PS2 and -- and the existence of are recording data was asked with the gestalt of said operation when [of the migration transmitters PS1 and PS2 and --] it returned in a power up and a service area, otherwise to the method which asks the existence of are recording data, the various following methods can be considered.

[0068] The 1st method notifies the existence of are recording data from the migration communications control station CS automatically to the migration transmitters PS1 and PS2 and -- first. For example, the migration communications control station CS transmits the message information on to that effect for the existence of each migration transmitters PS1 and PS2 and the are recording data of every -- using periodical or the arrival-of-the-mail control channel set up according to the intermittent receive mode to the migration transmitter which judges at any time and has are recording data. At this time, transmission of message information is performed by finding timing without the call-in signal which should be transmitted by the arrival-of-the-mail control channel.

[0069] Whether powering-on actuation will not be performed by the migration transmitters PS1 and PS2 and -- if it does in this way, or it does not return from the outside of a service area in area, and when data accumulation is performed to the are recording service server SV, that will be automatically notified to the migration transmitter which corresponds from the migration communications control station CS. for this reason, the migration transmitters PS1 and PS2 and the user of -- the existence of the are recording data addressed to self -- ** -- it becomes possible to get to know early. Moreover, since timing without

the call-in signal which should be transmitted by the arrival-of-the-mail control channel was found and the informative message is transmitted, there is no fear of not producing pressure of the traffic of an arrival-of-the-mail control channel, and a bad influence attaining to transmission of an original call-in signal by this.

[0070] In addition, the technique of having combined the display of the technique and the above-mentioned display message which carry out the sound-reinforcement output of the migration transmitters PS1 and PS2, the technique of -- displayed on a liquid crystal display, and the voice-told message for the display message of the purport which has are recording data, for example from a hand-set loudspeaker as a notice method of message information, generating of singing, or flashing of light emitting diode can be considered.

[0071] Call origination and location registration actuation are performed in the migration transmitters PS1 and PS2 and --, or, as for the 2nd method, a call-in signal comes. When between the migration communications control stations CS is connected with the migration transmitters PS1 and PS2 and -- through a control channel by this In the migration communications control station CS, the existence of the are recording data of the addressing to a migration transmitter concerned is judged, and when there are are recording data, the message information on to that effect is notified to a migration transmitter.

[0072] If it does in this way, since the existence of are recording data will be notified to a migration transmitter at the times, such as call origination and a call in, it can tell more certainly that there are are recording data to a user. Moreover, since the notice of message information is performed as one of the procedure of the during a call origination procedure, a location registration procedure, and a call-in procedure, pressure of the traffic of a control channel is not produced by the notice of message information.

[0073] The 3rd method makes a power source an ON state temporarily in the migration transmitters PS1 and PS2 and -- for every time of day fixed even when the power source is turned off. The access request signal for asking the existence of the are recording data addressed to a stage using a dispatch control channel is transmitted to the migration communications control station CS. The migration communications control station CS is notified to the migration transmitter of demand-message information which judges existence of are recording data of addressing to migration transmitter which corresponds if above-mentioned access request is received, and expresses the result origin. If it does in this way, though the migration transmitter is turned off [power-source] over the long time, the user of a migration transmitter can be notified of existence of are recording data.

[0074] or [moreover, / the migration transmitters PS1 and PS2 and -- memorizing the message information showing the judgment result of the existence of the are recording data sent from the migration communications control station CS at this time, reading the above-mentioned message information periodically until a user notices an are recording message existence and transmits the access request of are recording data after that, and making it display on the drop of a migration transmitter] -- or it is good to carry out a voice output. Since it will become unnecessary to perform henceforth the inquiry which used the control channel between the migration transmitter and the migration communications control station CS, and the notice of the result if it does in this way once it receives the message information showing the judgment result of the existence of the are recording data sent from the migration communications control station CS, it is not necessary to press the traffic of a control channel.

[0075] In addition, this invention is not limited to the gestalt of each above-mentioned implementation. For example, although the gestalt of said operation explained the case where two kinds of intermittent receive modes were prepared, you may constitute so that three or more kinds may be established and these modes may be set up alternatively.

[0076] Moreover, although the intermittent receive mode was changed into the mode of the short period T1 from the mode of the long period T2 with the gestalt of said operation when the intermittent receive mode of the long period T2 was set as the migration transmitter PSi of an arrival-of-the-mail place and the incoming call was demanding two-way simultaneous communication service of a telephone, a TV phone, etc., you may make it change into a target not the mode of the short period T1 but temporarily at

continuous reception mode. When are done in this way and a calling party redoes call origination, it becomes possible to carry out a real time to this call origination.
[0077] Furthermore, in the range which may prepare in a migration communications control office, in addition deviates from the summary of this invention neither about a configuration, nor a control procedure, the contents of control of a migration transmitter and the migration communications control office, etc., an are recording service server deforms variously and can be carried out.
[0078]
[Effect of the Invention] In the migration communication system equipped with the mobil radio communication network which holds two or more migration communication devices and these migration communication devices through a radio channel, respectively in this invention as explained in full detail above A receiving means to set up alternatively two or more sorts of intermittent receive modes from which an intermittent receiving period differs during waiting, and to perform intermittent reception actuation to each of two or more above-mentioned migration communication devices, It has a notice means of the intermittent receive mode to notify the information about the intermittent receive mode under setup for this receiving means to the above-mentioned mobil radio communication network. And he is trying to have a transmitting means to transmit a signal the transmitting period corresponding to the intermittent receive mode notified to the mobil radio communication network from the migration communication device concerned to each migration communication device under waiting.
[0079] Therefore, according to this invention, the power consumption at the time of waiting in a migration communication device can be reduced further, and the migration communication system which can moreover reduce the unnecessary signal transmission to the migration communication device under waiting from a mobil radio communication network, and can aim at improvement in the rate of a deployment of a control channel, and its mobil radio communication network list can be provided with mobile station equipment.
[0080] Moreover, when the incoming call to each above-mentioned migration communication device occurs in a mobil radio communication network, by other invention, it is made it having a communication-service judging means judge the class of communication service which an origination side requires, and a communications control means, and the arrival-of-the-mail processing of different contents to the migration communication device concerned carrying out according to the intermittent receive mode under setup notified by this communications control means from the judgment result of the above-mentioned communication-service judging means, and the migration communication device of an arrival-of-the-mail place.
[0081] Therefore, according to this invention, the migration communication system which can lengthen an intermittent receiving period, can aim at much more reduction of the power consumption at the time of waiting, can mitigate the bad influence to the incoming call produced by moreover lengthening an intermittent receiving period, and can hold good serviceability, and its mobil radio communication network list can be provided with mobile station equipment.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] The outline block diagram of PHS which is the gestalt of 1 operation of the migration communication system concerning this invention.
[Drawing 2] Drawing showing an example of the transmit timing of a migration communications control station, and the receiving timing of each migration transmitter group in the intermittent receive mode of a short period.
[Drawing 3] Drawing showing an example of the transmit timing of a migration communications control station, and the receiving timing of each migration transmitter group in the intermittent receive mode of a long period.
[Drawing 4] The sequence diagram showing the control action at the time of the arrival of the system shown in drawing 1 .
[Drawing 5] The flow chart which shows the procedure and the contents of control of are recording control in a migration communications control station.
[Drawing 6] The sequence diagram showing the inquiry of the are recording data of a system and are recording data transfer control which were shown in drawing 1 .
[Drawing 7] The sequence diagram showing intermittent receiving period modification control of the system shown in drawing 1 .
[Drawing 8] The timing chart for explaining an example of the conventional intermittent receiving method.
[Description of Notations]
A communication network besides NW--
CS -- Migration communications control station
BS1, BS2, -- base station
PS1, PS2, -- migration transmitter
Z1, Z2, -- wireless zone
SV -- Are recording service server
SF -- Super frame synchronization channel
L, L1-1 -L8-60 -- Subframe for short periods
M1-M8 -- Subframe for long periods
F -- Frame synchronization channel
P1-P8 -- Paging channel
T1 -- Period of the 1st intermittent receive mode (short period)
T2 -- Period of the 2nd intermittent receive mode (long period)

[Translation done.]

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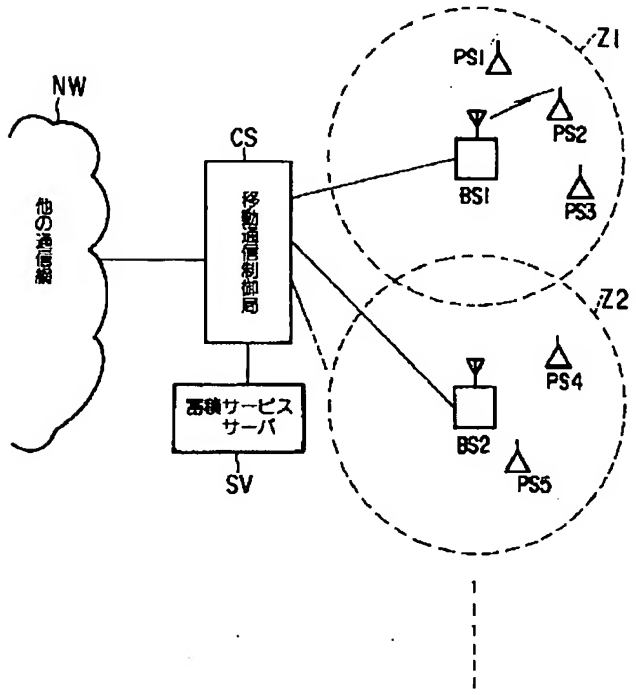
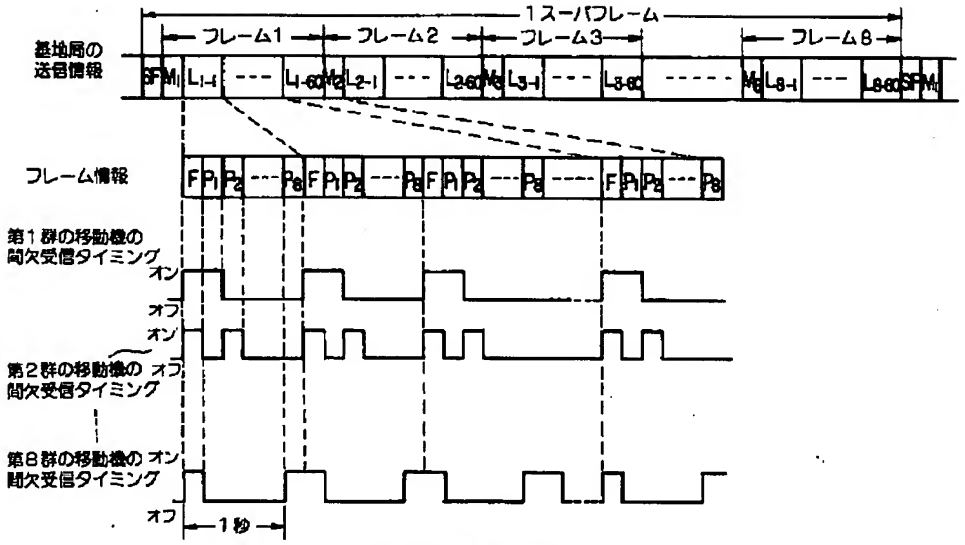
3.In the drawings, any words are not translated.

DRAWINGS

[Drawing 1]

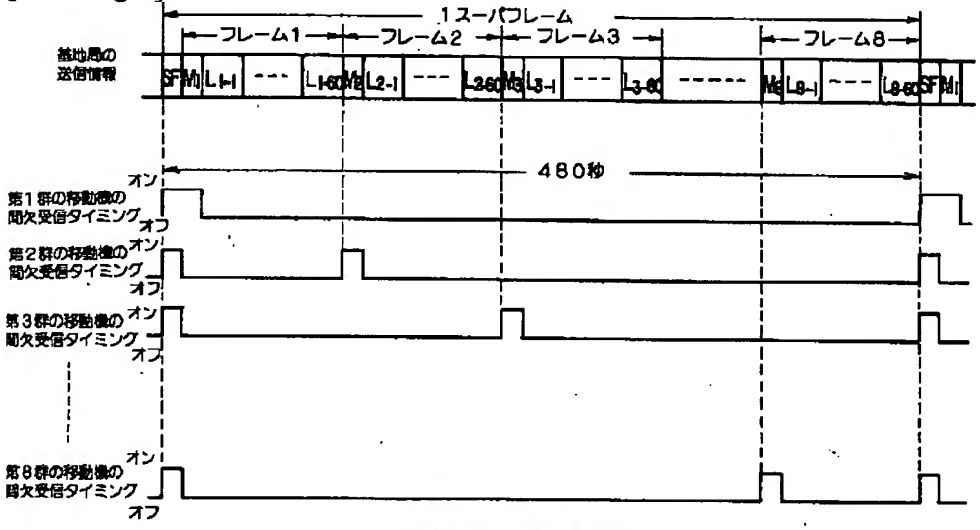


[Drawing 2]



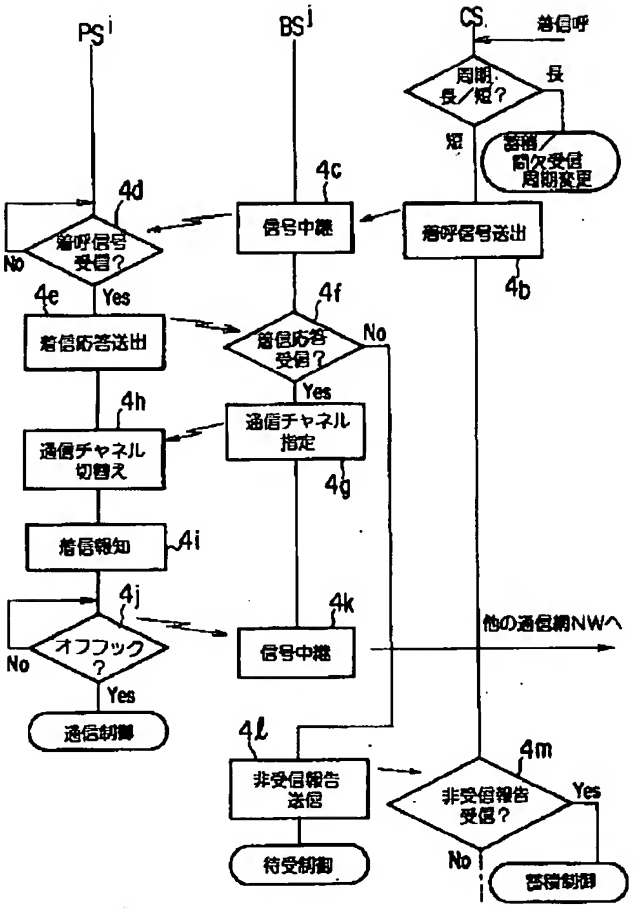
短周期T1の間欠受信モード

[Drawing 3]

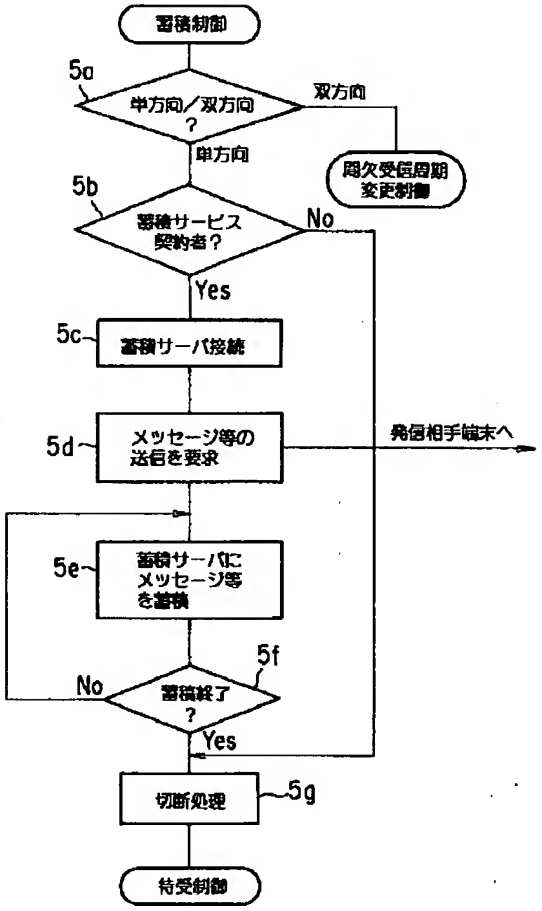


長周期T2の間欠受信モード

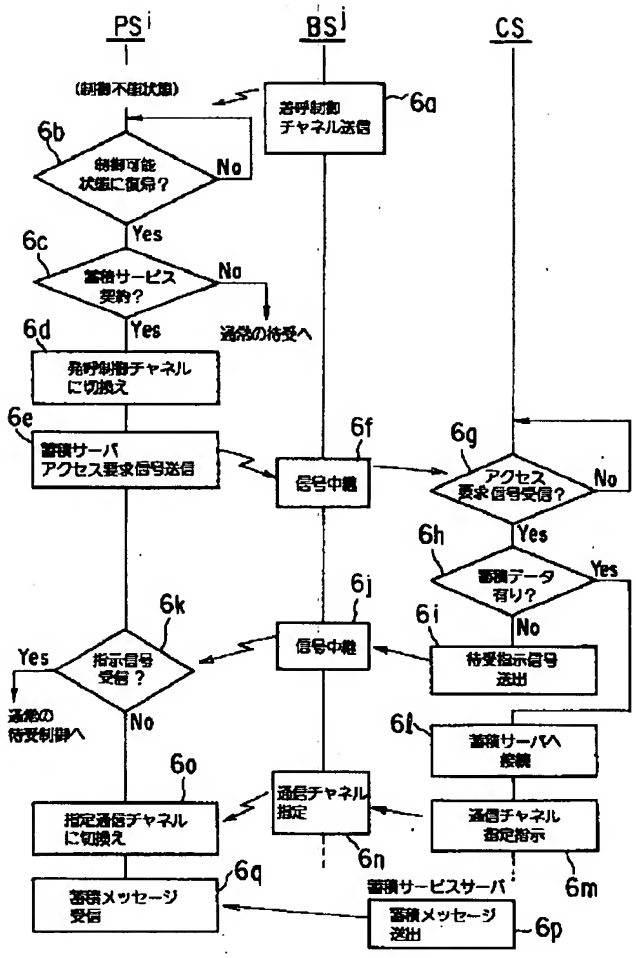
[Drawing 4]


PSi
BSi
CS
着信呼
周期長/短?
長
短
着信/同次受信周期変更
4c
4d
信号中継
着呼信号送出
着呼信号受信?
No
4e
Yes
4b
4f
着信応答送出
着信応答受信?
No
Yes
4h
通信チャネル指定
通信チャネル切替え
4g
着信報知
4i
4j
4k
他の通信網NWへ
オフフック?
No
Yes
信号中継
通信制御
4l
4m
非受信報告送信
非受信報告受信?
Yes
No
待受制御
着信制御

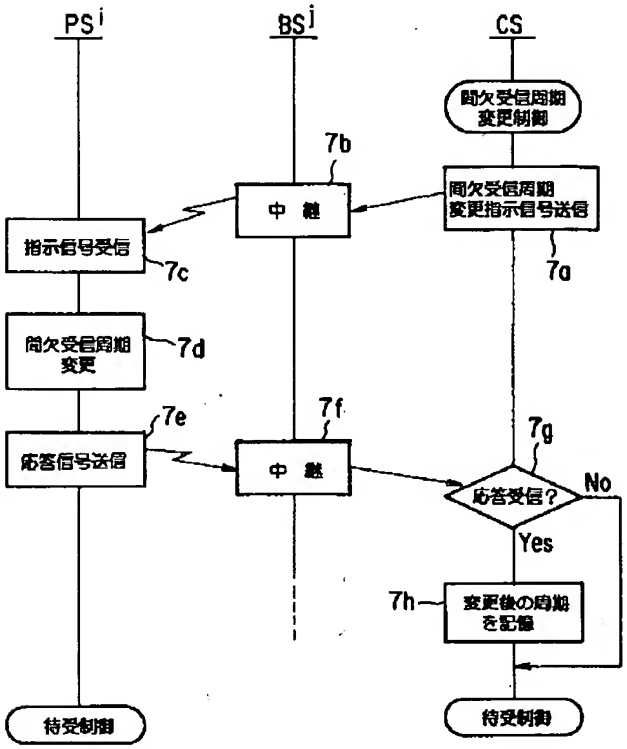
[Drawing 5]


蓄積制御
5a
単方向／双方向？
双方向
単方向
周欠受信周期変更制御
5b
蓄積サービス契約者？
No
Yes
5c
蓄積サーバ接続
5d
メッセージ等の送信を要求
発信相手端末へ
5e
蓄積サーバにメッセージ等を蓄積
5f
No
蓄積終了？
Yes
切断処理
5g
待受制御

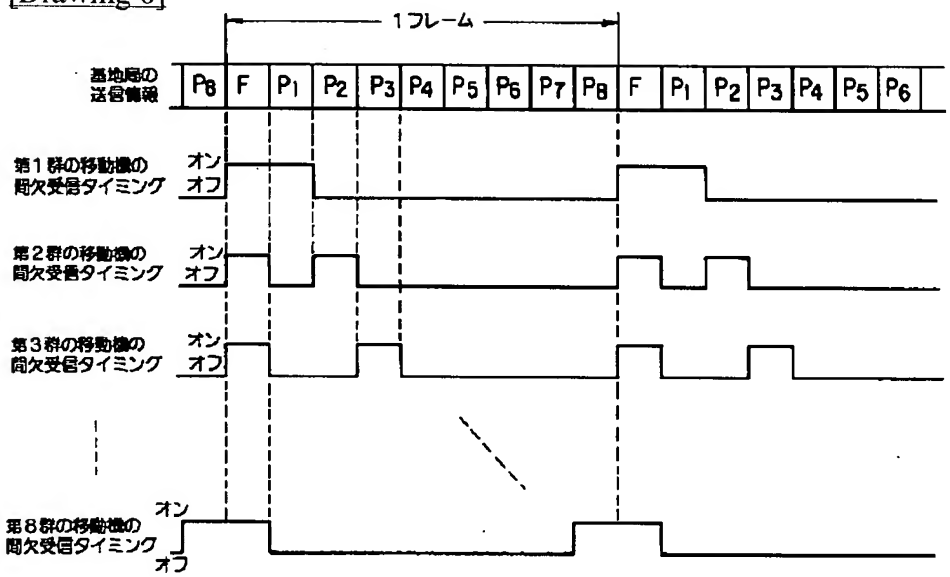
[Drawing 6]


PS^i
BS^i
CS
(制御不能状態)
着呼制御チャネル送信
6a
6b
制御可能状態に復帰?
No
Yes
6c
蓄積サービス契約?
No
Yes
通常の待受へ
6d
発呼制御チャネルに切換え
6e
蓄積サーバアクセス要求信号送信
6f
信号中継
6g
アクセス要求信号受信?
No
Yes
6h
蓄積データ有り?
Yes
No
6i
待受指示信号送出
6j
信号中継
6k
指示信号受信?
Yes
No
通常の待受制御へ
6l
蓄積サーバへ接続
6o
指定通信チャネルに切換え
通信チャネル指定
通信チャネル指定指示
6n
6m
蓄積サービスサーバ
6q
蓄積メッセージ受信
蓄積メッセージ送出
6p

[Drawing 7]


PS^i
BS^i
CS
間欠受信周期変更制御
7b
中継
間欠受信周期変更指示信号送信
7a
指示信号受信
7c
間欠受信周期変更
7d
7e
応答信号送信
7f
中継
7g
応答受信?
No
Yes
7h
変更後の周期を記憶
待受制御
待受制御

[Drawing 8]



[Translation done.]

* NOTICES *

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damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CORRECTION OR AMENDMENT

[Kind of official gazette] Printing of amendment by the convention of 2 of Article 17 of Patent Law
[Section partition] The 3rd partition of the 7th section
[Publication date] October 12, Heisei 13 (2001. 10.12)

[Publication No.] JP,9-83427,A
[Date of Publication] March 28, Heisei 9 (1997. 3.28)
[Annual volume number] Open patent official report 9-835
[Application number] Japanese Patent Application No. 7-236615
[The 7th edition of International Patent Classification]

H04B 7/26
H04Q 7/18

[FI]

H04B 7/26 X
103 M

[Procedure revision]
[Filing Date] December 8, Heisei 12 (2000. 12.8)
[Procedure amendment 1]
[Document to be Amended] Specification
[Item(s) to be Amended] Claim 1
[Method of Amendment] Modification
[Proposed Amendment]
[Claim 1] In the migration communication system equipped with the migration communication device and the mobil radio communication network which holds this migration communication device through a radio channel, respectively,
Said migration communication device,
A receiving means to have two or more sorts of intermittent receive modes from which an intermittent receiving period differs, to set up these intermittent receive modes alternatively during waiting, and to perform intermittent reception actuation,
It has a notice means of the intermittent receive mode for notifying the information about the intermittent receive mode under setup for this receiving means to said mobil radio communication network,
Said mobil radio communication network,
Migration communication system characterized by having a transmitting means to transmit a signal the transmitting period corresponding to the intermittent receive mode notified from the migration communication device concerned, to said migration communication device under waiting.

[Procedure amendment 2]
[Document to be Amended] Specification
[Item(s) to be Amended] Claim 2
[Method of Amendment] Modification
[Proposed Amendment]
[Claim 2] In the migration communication system equipped with the migration communication device and the mobil radio communication network which holds this migration communication device through a radio channel, respectively,
Said migration communication device,
A receiving means to have two or more sorts of intermittent receive modes from which an intermittent receiving period differs, to set up these intermittent receive modes alternatively during waiting, and to perform intermittent reception actuation,
It has a notice means of the intermittent receive mode for notifying the information about the intermittent receive mode under setup for this receiving means to said mobil radio communication network,
Said mobil radio communication network,
The communication service judging means for judging the class of communication service which an origination side requires when the incoming call to said migration communication device occurs,
Migration communication system characterized by having a communications control means to perform arrival-of-the-mail processing of different contents to the migration communication device concerned, according to the intermittent receive mode under setup notified from the judgment result of this communication service judging means, and the migration communication device of an arrival-of-the-mail place.
[Procedure amendment 3]
[Document to be Amended] Specification
[Item(s) to be Amended] Claim 11
[Method of Amendment] Modification
[Proposed Amendment]
[Claim 11] In the migration communication system equipped with the migration communication device and the mobil radio communication network which holds this migration communication device through a radio channel, respectively,
Said migration communication device,
A receiving means to have two or more sorts of intermittent receive modes from which an intermittent receiving period differs, to set up these intermittent receive modes alternatively during waiting, and to perform intermittent reception actuation,
It has a notice means of the intermittent receive mode for notifying the information about the intermittent receive mode under setup for this receiving means to said mobil radio communication network,
Said mobil radio communication network,
The communication service judging means for judging the class of communication service which an origination side requires when the incoming call to said migration communication device occurs,
Migration communication system characterized by having a communications control means to transmit the information which directs modification of the intermittent receive mode to the migration communication device concerned to the intermittent receiving period of the migration communication device concerned, according to the intermittent receive mode under setup notified from the judgment result of this communication service judging means, and the migration communication device of an arrival-of-the-mail place.

[Translation done.]